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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PETER G. BOWLES, EMMANUEL I. EWEKA,
CYRIL O. GIWA, and ANDREW G. RITCHIE

Appeal 2009-0214
Application 10/786,418
Technology Center 1700

Decided:¹ May 19, 2009

Before ADRIENE LEPIANE HANLON, TERRY J. OWENS, and
PETER F. KRATZ, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL
STATEMENT OF THE CASE

The Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1-4, 6-21, and 23-30, which are all of the pending claims. We have jurisdiction under 35 U.S.C. § 6(b).

¹ The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the Decided Date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

The Invention

The Appellants claim a pouch battery and a method for making it.
Claim 1 is illustrative:

1. A pouch battery comprising an electrode assembly, said assembly formed by respectively overlaying a sheet cathode, a sheet separator and a double-sided sheet anode to form a stacked structure, and subjecting the stacked structure to multiple folds, wherein the initial fold comprises folding the cathode in half around the double-sided anode so as to surround the respective upper and lower active anode surfaces thereof, and wherein one or more subsequent folds is made with the fold line extending perpendicular to the original length of the stacked structure and its overall length is halved at each fold.

The References

Aamodt 2003/0194604 A1 Oct. 16, 2003

C.O. Giwa et al. (Giwa), "Scale-Up of Lithium / Carbon Monofluoride Envelope Cells", in *Proc. of the 39th Power Source Conf.* 32-35 (June 12-15, 2000).

The Rejections

The claims stand rejected as follows: claims 1-4, 6-15, 17-21, and 23-29 under 35 U.S.C. § 102(b) over Giwa, and claims 16 and 30 under 35 U.S.C. § 103 over Giwa in view of Aamodt.

OPINION

We affirm the rejection under 35 U.S.C. § 102(b) and reverse the rejection under 35 U.S.C. § 103.

Rejection under 35 U.S.C. § 102(b)

Issue

Have the Appellants shown reversible error in the Examiner's determination that Giwa discloses, expressly or inherently, a stacked structure having multiple folds, each fold being formed by folding the overall length of the stacked structure in half?

Findings of Fact

Giwa discloses a primary cell comprising cathode sheets folded around a central lithium anode (p. 32, "Abstract"; p. 33, "Cell Construction").

The cells used a folded construction with each fold being 7.5 x 7.5 cm. The cells were folded successively, from 1 to 5 times giving active areas of 15 x 7.5 cm up to 240 x 7.5 cm (1.125 to 18 Ah).

(p. 33, "Cell Construction")

Analysis

"Anticipation requires that every limitation of the claim in issue be disclosed, either expressly or under principles of inherency, in a single prior art reference." *Coming Glass Works v. Sumitomo Elec. U.S.A., Inc.*, 868 F.2d 1251, 1255-56 (Fed. Cir. 1989).

The Examiner argues that the overall length of Giwa's stacked structure necessarily is halved at each fold because halving the 15 x 7.5 cm stacked structure once and halving the 240 x 7.5 cm stacked structure 5 times (120 cm after first fold, 60 cm after second fold, 30 cm after third fold, 15 cm after fourth fold, and 7.5 cm after fifth fold) both produce the desired 7.5 cm x 7.5 cm structure (Ans. 7-8).

The Appellants argue that Giwa's stacked structure is not necessarily halved at each fold because Giwa's disclosure that "[t]he cells were folded successively, from 1 to 5 times giving active areas of 15 x 7.5 cm up to 240 x 7.5 cm" (p. 33, "Cell Construction") could mean that the 240 x 7.5 cm stacked structure is folded in five places to form a fan-shaped stacked structure having six 40 x 7.5 cm sections (Br. 16). The Appellants argue that if Giwa is construed in that manner, then Giwa's first above-quoted sentence ("The cells used a folded construction with each fold being 7.5 x 7.5 cm", p. 33, "Cell Construction") must either contradict the second above-quoted sentence ("The cells were folded successively, from 1 to 5 times giving active areas of 15 x 7.5 cm up to 240 x 7.5 cm (1.125 to 18 Ah)", *Id.*), or Giwa must be using a folding method that differs from both fan-shaped folding and the Appellants' halving at each fold (Br. 17-18).

The inconsistency in Giwa's first and second sentences that results from the Appellants' interpretation of Giwa indicates the error in the Appellants' interpretation. The only interpretation of those two sentences that renders them consistent is the Examiner's interpretation set forth above. As indicated by that interpretation, Giwa necessarily discloses a stacked structure formed by halving its overall length at each fold.

Conclusion of Law

The Appellants have not shown reversible error in the Examiner's determination that Giwa discloses, expressly or inherently, a stacked structure having multiple folds, each fold being formed by folding the overall length of the stacked structure in half.

Rejection under 35 U.S.C. § 103

Issue

Have the Appellants shown reversible error in the Examiner's determination that Giwa and Aamodt would have rendered prima facie obvious, to one of ordinary skill in the art, a current collector in the form of a mesh or grid with lithium foil occupying the openings thereof to form a double-sided lithium anode?

Findings of Fact

Aamodt discloses "an anode constructed from a thin piece of lithium foil [15] joined at one end to a thicker piece of lithium foil [10] such that the thin lithium foil forms the outermost winding of a coiled electrode and the thicker lithium foil forms the inner windings" (¶ 0013). "The thicker foil forming the inner windings provides enough lithium for depleting into the cathode material facing both sides of the inner windings", *id.*, i.e., the thicker foil is a double-sided anode. "The thinner foil forming the outermost winding provides enough lithium for depleting into the cathode material facing only the inner side of the outermost winding", *id.*, i.e., the thinner foil functions as a single-sided anode. "The two lithium foils overlap each other to provide continuity, but this overlap is minimized to prevent an excess of lithium and reduce the amount of lithium required for construction" (*Id.*). "A metal grid functions as a current collector [5] and advantageously stabilizes and reinforces the cohesive bond between the two lithium foils." *Id.* To form the anode, current collector 5 is laid over thinner lithium foil 15 and the area of overlap (8) such that thicker lithium foil 10 is sandwiched between thinner lithium foil 15 and current collector 5 in region of

overlap 8, and then current collector 5 is pressed against the foils such that it reinforces area of overlap 8 (¶ 0027; Fig. 2).

Analysis

The Appellants argue that “Aamodt does not teach a double-sided lithium anode in the form of a mesh or grid. Rather, Aamodt merely teaches that a current collector in the form of a metal grid can be used, in a wound lithium battery, to stabilize and reinforce the cohesive bond between two lithium foils” (Br. 20).

The Examiner argues that “a current collector in the form of a metal grid that reinforces two lithium foils essentially forms a double sided lithium anode in the form of a mesh or grid with lithium foil occupying the openings thereof” (Ans. 8).

“‘[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.’” *KSR Int’l. Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

The Examiner has not provided the required articulated reasoning with rational underpinning to establish that Aamodt’s collector 5 is pressed against lithium foils 10 and 15 in such a way that it forms a double-sided anode comprising metal grid current collector 5 having lithium foil occupying its openings. That burden is not met by the Examiner’s mere assertion that Aamodt’s technique “essentially” forms such a structure (Ans. 8).

Conclusion of Law

The Appellants have shown reversible error in the Examiner's determination that Giwa and Aamodt would have rendered prima facie obvious, to one of ordinary skill in the art, a current collector in the form of a mesh or grid with lithium foil occupying the openings thereof to form a double-sided lithium anode.

DECISION/ORDER

The rejection of claims 1-4, 6-15, 17-21, and 23-29 under 35 U.S.C. § 102(b) over Giwa is affirmed. The rejection of claims 16 and 30 under 35 U.S.C. § 103 over Giwa in view of Aamodt is reversed.

It is ordered that the Examiner's decision is affirmed-in-part.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED-IN-PART

PL
sld

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